

# Implementing Resource Directed Water Quality Management: From Policy to Management Instruments to Operational Adoption

J. Hattingh<sup>2</sup>, M. Claassen<sup>2</sup>, P. Viljoen<sup>1</sup>, J. Van Wyk<sup>1</sup>, K. Murray<sup>3</sup> and D.J. Roux<sup>2</sup>

<sup>1</sup> Department of Water Affairs and Forestry, Directorate: Water Resource Planning Systems, Private Bag X313, Pretoria, 0001

<sup>2</sup> CSIR Environmentek, Water Programme: Water Resources Management, , PO Box 395, Pretoria, 0001

<sup>3</sup> Insight Modelling Services, PO Box 38953, Garsfontein East, 0060.

## ABSTRACT

The National Water Act, 1998 gave a new direction to water resources management. The Resource Directed Water Quality Management (RDWQM) project aligns water quality management with resource-directed principles. This project included the development of an operational policy, a strategy and management instruments. The RDWQM policy adds value to the National Water Act principles, by providing an interpretation in the context of RDWQM. The RDWQM strategy describes how to implement the policy and the management instruments give effect to resource directed water quality management.

To facilitate the successful implementation of these instruments, it was critical to obtain adoption from the stakeholders, and ensure integration with other initiatives within DWAF.

A successful aspect of the project was the synergistic co-evolution of the stakeholders towards developing the best solutions and outcomes and most have accepted the positive implications of using these instruments. Active and continuous engagement of stakeholders facilitated the adoption of the products.

**Keywords:** *resource directed water quality management, sustainable development, implementation, buy-in and adoption*

## 1 INTRODUCTION

Promulgation of the National Water Act of 1998 gave a new direction to water resources management and Water Quality Management (WQM) in South Africa. The purpose of the Act is to ensure that the nations' water resources are protected, used, developed, conserved, managed and controlled in an equitable, efficient and sustainable manner, requiring an integrated source, resource and remediation management approach.

The Act embodies a number of unprecedented policy directions related to the use, conservation, assessment and regulatory management of water resources. As a result, the past decade has seen rapid development of policies and methods, with much less attention given to criteria and principles for standardising decision-making processes. In general, decisions are being made on an *ad hoc* basis with little uniformity among regional offices.

An ongoing project to align water quality management with resource-directed principles has been initiated by the Department of Water Affairs and Forestry (DWAF). This project includes the development of operational policy - to support national policy – as well as management instruments ranging from a method for conducting rapid catchment visioning to a decision support system to assist proper consideration of the resource-directed (and other) requirements in the issuing of water quality licences.

DWAF was adamant about the successful implementation of this project, where implementation is defined as putting a new product, programme or service into practice. New findings and insights have to be diffused to end-users (water resource managers at Regional Offices and at a later stage the Catchment Management Agencies) from an early stage. The project aims to alleviate existing bottlenecks in resource management and licensing processes, and to involve regional staff on an ongoing basis in an attempt to promote user readiness and proper adoption of the new management instruments.

This paper reports on strategies to make the policy and instruments operationally applicable, while managing acceptance by the implementation institutions.

## 2 LEGAL FRAMEWORK

Although primarily focussed on the National Water Act and resource directed water quality management in particular, the Resource directed water quality management (RDWQM) project products are aligned with a broad spectrum of legislation and policy. An exhaustive list is not provided here. However, the following are the most relevant:

### *Legislation:*

- The Constitution of South Africa (Act No. 108 of 1996).
- National Environmental Management Act (Act No. 107 of 1998).
- National Water Act (Act No. 36 of 1998).

### *Policy:*

- Environmental Management Policy White Paper (DWAf, 1997b).
- National Water Policy White Paper (DWAf, 1997a).
- National Water Quality Management Framework Policy (DWAf, 2003a) (the policy most closely related to this policy).

### *Related strategies include:*

- National Water Resource Strategy (DWAf, 2002).
- Source Management Strategy (DWAf, 2003c).
- Remediation Strategy. (DWAf, 2004b)

The RDWQM policy will be revised in future to accommodate new legislation or policy if necessary.

## 3 RESOURCE DIRECTED WATER QUALITY MANAGEMENT

The following products were developed for the RDWQM project:

- A policy
- A strategy
- Management Instruments
- An implementation plan

The following sections provide a brief overview of these different products.

### **3.1 The RDWQM Policy**

The ultimate objective of the RDWQM policy is to provide effective guidance for decision makers in the innovative implementation of resource water quality considerations. The aim is to achieve *"water quality meeting quality of life and concurrently aquatic ecosystem health requirements on an ongoing basis by suitable protection of the country's water resources"* (DWAf, 2005).

To achieve this, the policy emphasises the underlying principles of water resource management. The practical difficulties faced in everyday decision-making in resource directed water quality management are significant. A clear description of underlying principles allows concise yet powerfully comprehensive policy statements to be made. This simplifies interpretation and hence their implementation. The principles are, in effect, 'the rules of the game' (DWAf, 2005).

Many of the principles arise from, and are common to, a variety of policies and legislation, including the Constitution (108:1996). The most important principles in the current context are those upon which decision-making is formally based. Other principles drive actions in management processes that create the environment in which these decisions can be made more effectively (DWAf, 2005).

The most relevant principles occur in the National Water Policy White Paper (DWAf, 1997). The RDWQM policy adds value to them by providing an interpretation that is more currently relevant in the context of resource directed water quality management (DWAf, 2005).

#### **3.1.1 Policy Philosophy**

The principle of sustainable development is at the core of every aspect of the RDWQM Policy. *Strong sustainable development* is strived for at the national level. However, the inevitability of *weak sustainable development* at local level is acknowledged particularly in instances where the socio-economic advantages are considered to outweigh ecological impacts. However, when all such local decisions are balanced at national level, the emphasis must be towards an overall application of *strong sustainable development* the former latter (DWAf, 2005).

If the choice of a management class is based on the relative importance (to stakeholders) of protecting ecosystem health and satisfying the needs of water users, and it is decided that the former has to be compromised (traded off) against the latter, then this will be explicitly acknowledged as deviating from *strong sustainable development* (DWAf, 2005).

Improving the quality of life of all South Africans is the ultimate goal. It is inherently assumed that this is inextricably linked, directly and indirectly, with maintaining the health of aquatic ecosystems (DWAF, 2005).

Sustainable development in the context of water resource management is enabled by six main principles namely:

- Protection of water resources;
- Optimal water use;
- Equity between generations;
- Current equitable access;
- Environmental integration; and
- Good governance

Resource directed measures (RDM) comprise important instruments that support improvement in quality of life. These measures relate to the Reserve, the management class and associated resource quality objectives (RQOs). The philosophy of sustainable development entails balancing the social and economic needs of people with impacts on ecological systems. RDM allow this balance to be managed (DWAF, 2005). In striving for this balance, the Policy call for equity, *i.e.* being just and fair in the sense of being based on laws and accepted principles. It is specifically the philosophy of sustainable development and its application with political realities that necessitate appropriate principles for finding an equitable balance.

### 3.1.2 Policy Principles

To address each of the above specific objectives, the Policy deals rigorously with underlying principles. Not only are the principles identified, each is also carefully defined as mutually exclusively as possible. The principles capture a basic value system appropriate for consistent nationwide water quality resource management ultimately aimed at improved quality of life for all South Africans. Each principle is also associated with its underlying values-based assumption to help decision-makers and stakeholders understand why the principle is regarded as important. These principles are regarded as "*the rules of the game*".

The policy also addresses the way certain principles are related. This adds further structured and holistic insight into why certain principles are important in certain contexts and less so in others. This relatedness is captured in so-called "*hierarchies of enabling principles*" in which series of principles that enable other principles are identified. These create effective checklists when a particular principle is being applied: "*Applying a principle*" then means that the principle itself and all the enabling principles below it must be considered.

The principles described fall in the following categories: decision-making; sustainable development (including, in particular, protection of water resources, optimal water use, equity between generations, current equitable access and environmental integration); stakeholder engagement; general management and governance; and integrated water quality management.

### 3.1.3 Policy Statements

The Policy describes in detail RDWQM policy statements relating to:

- The strategic national perspective;
- HIV/Aids;
- Poverty;
- Past inequities;
- Principle-based decision-making;
- Creative problem solving;
- Sustainable development (enabled in particular by protection of water resources, optimal water use, equity between generations, current equitable access and environmental integration);
- Effective stakeholder engagement;
- People first ("*Batho pele*");
- Adaptive management;
- General legislative alignment;
- Sound financial management;
- Prudent pragmatism;
- Good governance (and, in particular, the enabling principle of co-operative governance);
- Gender equity; and
- Value-based pricing.

The policy suggests adopting a principle-based decision-making approach that is firmly based on sound and accepted principles in addressing issues. These include principle inclusiveness, due diligence, integrated balance and due process.

In the context of integrated water quality management, the Policy suggests applying the following principles in the priority order indicated:

- *Pollution prevention:* Resources that are vulnerable, sensitive or rare and in a natural or near-natural state will be given special consideration. Groundwater will be regarded as vulnerable by default unless it can be shown otherwise.
- *Waste minimisation:* The Department acknowledges that some degradation of water resources is inevitable. However, waste minimisation and efficient use will be strongly encouraged at all times, irrespective of the degree of water quality stress.
- *Precautionary approach:* It is the Department's policy to allow degradation when there exists sufficient allocatable water quality. However, uniform minimum requirements will be set and applied by the Department.
- *Differentiated approach:* In catchments with no water quality stress, it is the Department's policy to enforce uniform minimum requirements. In other catchments, it is policy to (1) consider stricter requirements and/or (2) strictly regulate or prohibit unsustainable practices in order to achieve the management class. In all cases, decisions must be strongly motivated in terms of sustainable development.
- *Rehabilitation:* In order to promote optimal water use and protection of water resources, the Department will facilitate rehabilitation of resources where this is considered necessary and practical.

A *Philosophy on Sustainable Development*, focussing on RDWQM, supports the policy.

### 3.2 Strategy

Whereas, the RDWQM policy provides guidance on what should be done in terms of resource directed water quality management, the RDWQM strategy describes how to implement the policy statements and principles. Typically, this relates to "who should do what be when". It identifies roles and role players (the institutional arrangements) and provides operational strategies in a number of specific contexts (catchment assessment, catchment visioning, determining RDMs and giving effect to RDMs). Monitoring, capacity creation and maintenance are also addressed.

### 3.3 Management Instruments

The third tier giving effect to resource directed water quality management comprises the management instruments.

The aim of the Management Instruments is to assist the Regional Offices, and when established, the catchment management agencies, to make the *water quality* component of RDMs operational. This is made possible, by ensuring that RDWQM is considered within the licensing process and more importantly to support the Department with the evaluation and issuing of licences in a catchment and resource context (DWAF, 2004a).

A number of these management instruments have been developed to give effect to the policy and strategy, whilst supporting the sustainable development philosophy. The Management Instruments forms part of the iterative RDWQM framework for making RDM operational in licensing. Figure 1 shows the RDWQM framework. The suite of management instruments is colour coded (DWAF, 2004a).

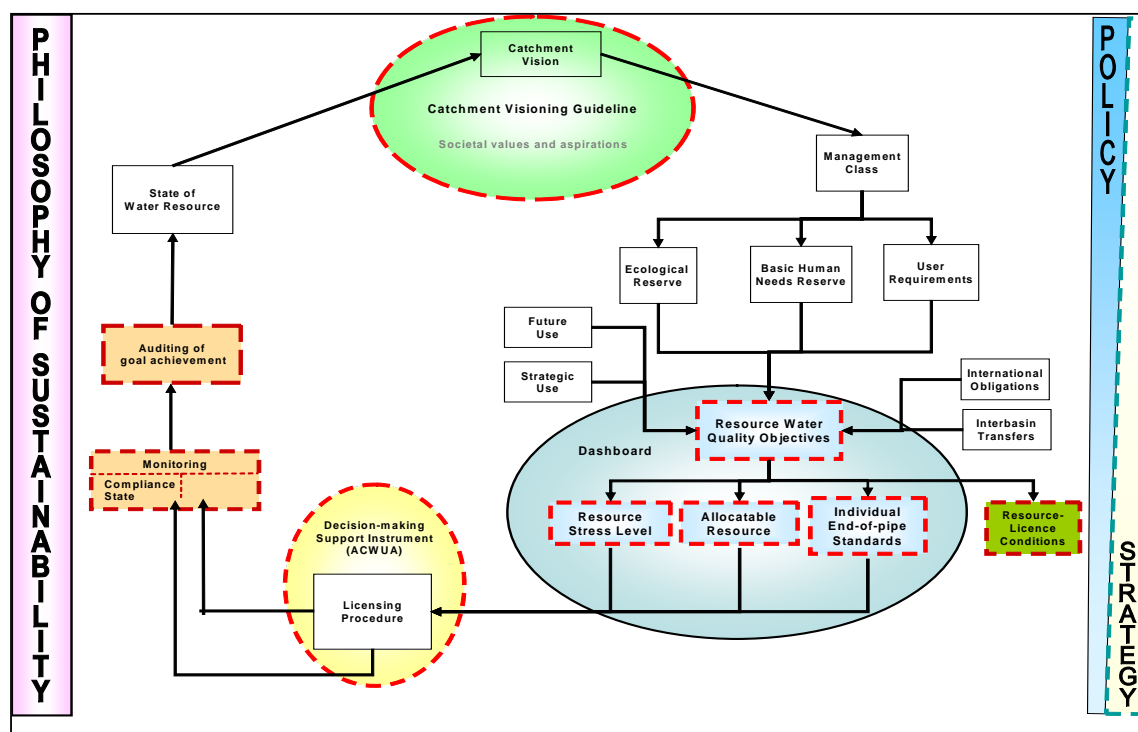


Figure 1: RDWQM Decision making framework (adapted from Van Wyk *et al*, 2003).

The management instruments are:

#### The Conceptual Review

The conceptual review provides an overview of the two main approaches adopted by DWAF for managing water resources, namely Resource Directed Measures (RDM) and Source Directed Controls (SDC). It also provides the broader context of the water use licensing process, by (DWAF, 2004a):

- Providing the context of the water use licensing process in terms of the National Water Act (NWA (36:1998)) (Act 36 of 1998);
- Explaining important terms used in the licensing process;
- Explaining in a step-by-step fashion how and where to apply for a water use licence, how a licence application is processed within DWAF, and noting what other aspects to consider;
- Providing advice to assist with the completion of a licence application form, and
- Providing a list of relevant sources of supporting information.

The Conceptual review can be used to assist every individual who either wants to apply for a water use licence, or who facilitates the licence application process (DWAF, 2004a).

#### Catchment Visioning Guideline

The first step in the RDWQM framework is the development of a catchment vision and the first management instrument in the 1<sup>st</sup> Edition Management Instruments suite is a guideline for generating a catchment vision and goals to inform the water allocation process. This instrument describes a practical process for developing a catchment vision and for disaggregating this vision into component management objectives (DWAF, 2004a).

The management class is determined based on the results of the catchment vision (DWAF, 2004a).

#### Guideline for determining Stress, Resource Water Quality Objectives (RWQOs) and the Allocatable Resource

The aim of this Guideline is to provide a practical, consistent approach to the determination of RWQOs, by integrating the results of the Catchment Vision, Resource Classification and Reserve, i.e. Resource Directed Measures, and to provide an approach to operationalising these RWQOs in the evaluation of licence applications through the allocatable resource (DWAF, 2004a).

The Guideline is supported by a “dashboard” MS Excel instrument to streamline the implementation thereof (DWAF, 2004a).

#### Guideline for Converting Resource Quality Objectives into End-of-Pipe Discharge Standards

This management instrument provides a low confidence method to convert the RWQOs into individual end-of-pipe discharge values. These values can be refined to provide standards to be included in licence conditions to monitor compliance with the RWQOs (DWAF, 2004a).

#### ACWUA - Decision-making Support System for RDWQM

A decision support instrument (software program), “Assessment of Considerations for Water Use Applications” (ACWUA), has been developed to support multiple criteria decision analysis which utilises indicators to inform decisions on licence allocations. Evidence in terms of indicators is characterised on the basis of impact (extent to which criteria are met) and uncertainty (confidence in evidence) (DWAF, 2004a).

ACWUA guides regional authorities, by supporting decision-making despite incomplete, imprecise, and variable information. The decisions are based on multiple criteria such as socio-economic factors, race and gender considerations and alignment with catchments strategy. While it integrates and presents information to inform decision-making, the responsible authority should evaluate the available information and ACWUA results in making the decision (DWAF, 2004a).

#### Guideline for the Formulation of Resource Specific Licence Conditions

This guideline addresses the issues around setting appropriate licence conditions to ensure that catchment visioning, and the Reserve and resource quality objectives (RQOs) are given effect specifically in the context of resource directed water quality management (DWAF, 2004a).

#### Guideline for Monitoring and Auditing of RDWQM

The purpose of this guideline is to provide general guidance for designing monitoring programmes related to resource water quality that collectively ensure useful statements can be made about the water quality in water resources and sustainable development (DWAF, 2004a).

By implementing these instruments:

- The catchment vision, the Class, RWQOs/ RQOs and other planning requirements can be linked to source directed management;
- RDMs can be implemented uniformly throughout South Africa from a resource water quality perspective; and
- Resource evaluation procedures and evaluations are legally defensible.

## **4 IMPLEMENTATION**

### **4.1 Objectives**

As mentioned previously, DWAF was adamant about the successful implementation of this project, where implementation is defined as putting a new product, programme or service into practice. This criterion, with further requirements of the products such as the policy being unambiguous, legally defensible, balanced and practical, was a pertinent part of the terms of reference for this project.

To facilitate the successful implementation of these instruments, it was critical to:

- obtain buy-in and adoption from all the stakeholders within DWAF, and
- ensure integration with other initiatives and instruments being developed within DWAF.

### **4.2 Strategy to Ensure Implementation and Adoption**

To facilitate successful implementation, it was decided to:

- Make an official of the relevant directorate a permanent member of the project team, to ensure continuous input and feedback from and to the Department.
- Consult extensively with DWAF officials during the planning and development of the different products and to appoint regional representatives to focus on this project, which assisted with the identification of the specific needs and requirements of the different regions.
- Establish a technical integration committee with the relevant consultants of various related DWAF projects.
- Establish a liaison committee with DWAF officials responsible for the various projects within DWAF.
- Hold training sessions with all the regions and head office officials, to demonstrate the products and obtain input and feedback on the different products.

These measures were implemented over and above the standard Steering Committee meetings, with representation from different directorates and sub directorates within the Department. Some Steering Committee meetings included representatives from the Water Research Commission and other national government departments.

### **4.3 Degree of success**

#### **4.3.1 Successes**

One successful aspect of the project was that the Department and the Consultant synergistically co-evolved towards identifying and developing the best solutions and outcomes of the project. Most of the stakeholders involved in the development of these instruments have accepted the positive implications of using these instruments. This was mainly due to:

- The regular interactions between the project team members and the representatives from the DWAF. DWAF officials were part of the planning sessions and subsequently development of the products of the project. Project team members interacted with various DWAF officials on a regular basis to obtain input and best practice guidance on the different products.
- Even though regular whole day work sessions were not possible, two two-day workshops were held, as well as two sessions of product demonstration. The latter contributed to creating awareness and obtaining input and buy-in, because the interaction between the project team and the DWAF officials was on a personal level. The demonstration sessions were linked to a practical application, which was of great benefit to the DWAF officials.
- These sessions also facilitated the development of a shared understanding of the project goals and objectives between the Department, other consultants and the project team, thus, creating buy-into the products.
- A member of the DWAF project management team attended all the project team meetings. Problematic issues could be addressed immediately.
- In-depth training sessions were held in seven of the nine regions and two were held with head office officials.

#### **4.3.2 Constraints**

Even though the general feedback on the products to date has been positive and encouraging, the overall buy-in and adoption of the products cannot be adequately determined yet. Some resistance has been experienced towards the official acceptance of the products of the RDWQM project. The reason for this varies, but the following were some of the constraints experienced:

- The availability of some DWAF officials.
- The level of engagement was sometimes inadequate.
- There was a lack of feedback from some DWAF officials.
- A lack of common understanding of the relevant concepts.
- Varying levels of interest.
- Varying perceptions of the usefulness of the project products.
- Occasional inadequate internal communication.
- Lack of integration, or the willingness to integrate, despite efforts to address this.

## 5 CONCLUSION

The degree of success achieved has highlighted that it is essential to engage frequently with the target audience from inception to closure of the project. Active and continuous engagement and development of stake holder's capacity facilitates the adoption of the products, specifically when dealing with the full value chain of policy implementation, i.e. from developing enabling policy, strategy, instruments, through to implementation.

However, even a more critical element, is to actively listen and learn from the practitioners and implement the best practice guidelines.

Furthermore awareness creation is not adequate in itself to obtain buy-in. Actually engaging people on an individual basis, listening, learning from them, carefully considering their comments and input is essential. Buy-in and adoption cannot be forced. It requires sufficient time, constructive interaction and sufficient funding with commitment from both parties.

Ultimately, adoption can only be achieved, if the actual needs of the target audience are addressed.

## REFERENCES

- DWAF, 1997a. White Paper on a National Water Policy for South Africa. Department of Water Affairs and Forestry, Pretoria, South Africa.
- DWAF, 1997b. White Paper on Environmental Management Policy for SA. Department of Environment Affairs and Tourism, Pretoria, South Africa.
- DWAF, 2002. National Water Resource Strategy. Proposed First Edition. Department of Water Affairs and Forestry, Pretoria, South Africa.
- DWAF, 2003a. National Water Quality Management Framework Policy, Water Quality Management Series, Sub-series No. MS 7, Draft 1, Department of Water Affairs and Forestry, Pretoria, South Africa.
- DWAF. 2003b Development of Resource Directed Water Quality Management Policies: Inception Report. Water Resource Planning Systems, Sub-Series No. WQP 1.1. Second Edition. Pretoria.
- DWAF, 2003c. Source Management Strategy. No. M.6.0, 1<sup>st</sup> edition. Department of Water Affairs and Forestry, Pretoria.
- DWAF. 2004a. Water Resource Planning Systems Series, Sub-Series No. WQP 1.4, Resource Directed Water Quality Management: 1<sup>st</sup> Edition Management Instruments Series. Version 3. Pretoria.
- DWAF, 2004b. Remediation Strategy. [www.sa-remediation.co.za](http://www.sa-remediation.co.za).
- DWAF, 2005. Policy for Resource Directed Water Quality Management. Water Resource Planning Systems, Sub-Series No. WQP 1.5. Version 2.24. Pretoria.
- Van Wyk J.J., Moodley, P, and Viljoen, P. 2003. Towards Balancing Water Resource Protection With Water Resource Use and Development Integrated Water Quality Management in South Africa. Paper presented at IWA Conference 2003, Cape Town.